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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/334,671	06/17/1999	HENRI M. ROUGEOT	462-USA	5592

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EXAMINER	
LEE, SHUN K	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/334,671	ROUGEOT ET AL.
	Examiner	**Art Unit**
	Shun Lee	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s) _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-5, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morton (US 5,693,947) in view of Perez-Mendez (US 5,596,198) and Schiebel *et al.* (US 5,396,072).

It is noted that "thin" has been defined in the specification (pg. 4, line 14) as 2-50 μm. In regard to claims **1** and **14**, Morton discloses (Figs. 6 and 7) an indirect x-ray image detector suitable for radiology, comprising an active matrix substrate (102, FET 31) with scanning and read-out circuits (see Fig. 2), wherein over said active matrix substrate (102, FET 31) there is deposited a co-planar thin photoreceptor (*e.g.*, a 2 μm

thick intrinsic a-Si:H semiconductor layer 201; column 8, lines 45-51), said photoreceptor being covered with a light-transparent biasing electrode (202) on top of which there is provided an x-ray conversion scintillator (300 μm thick columnar caesium iodide 300; column 8, lines 45-51).

While Morton also discloses (column 10, line 35 to column 11, line 18) that "the radiation convertor may take a variety of different forms" such as "scintillators irradiating semiconductor layers" (*e.g.*, a caesium iodide scintillator 300 irradiating a 2 μm thick intrinsic a-Si:H semiconductor layer 201 as illustrated in Figs. 6 and 7), the detector of Morton lacks an explicit description that the semiconductor layers are a 2-50 μm (or 5-20 μm) thick amorphous selenium multilayer structure. However, semiconductor layers being irradiated by scintillators are well known in the art. For example, Perez-Mendez teaches (column 6, lines 60-67) that the semiconductor layers being irradiated by scintillators are multilayer (*i.e.*, p-i-n) photoreceptors formed of a-Si:H or alternatively selectable from a group of materials of like properties such as amorphous selenium. Further, the properties of amorphous selenium p-i-n detectors are known in the art. For example, Schiebel *et al.* teach (Fig. 3b) that an amorphous selenium p-i-n detector (32, blocking layers 31, 33) or an amorphous selenium n-i-p detector (*i.e.*, where the blocking layers interchanged; column 6, lines 50-56), wherein the n-layer functions as a hole blocking layer (column 5, lines 43-46) and the p-layer functions as an electron blocking layer (column 5, lines 29-33) and thus a p-i-n structure (or n-i-p structure) have the property of minimizing charge injection from the electrodes resulting in reduced dark current (column 1, line 58 to column 2, line 1). Therefore it would have been obvious to

one having ordinary skill in the art to provide a 2-50 μm thick amorphous selenium p-i-n (or n-i-p) structure as the semiconductor layers in the detector of Morton, in order to minimize charge injection from the electrodes so as to reduce dark current.

In regard to claim **2** which is dependent on claim 1, Morton also discloses (Fig. 6) where the active matrix substrate is a two dimensional array of thin film transistors (TFT; *i.e.*, field effect transistor FET 31) associated with a storage capacitance (10) and having conduction pads with electric connection to the photoreceptor (201).

In regard to claim **3** which is dependent on claim 2, Morton also discloses (Fig. 6) a storage capacitance (10 which is formed by drain electrode 134 and pixel electrode 103) that is a part of the TFT architecture (FET 31).

In regard to claim **4** which is dependent on claim 2, Morton also discloses (Fig. 6) a storage capacitance (20 which is formed by electrode 202 and electrode 101) that is an integral part of the photoreceptor (201).

In regard to claim **5** which is dependent on claim 2, Morton also discloses that the TFT (FET 31 in Fig. 6) are made of amorphous silicon (*i.e.*, a-Si:H; column 7, lines 15-17 and column 1, lines 24 and 25).

In regard to claim **20** which is dependent on claim 1, Morton also discloses that the scintillator (300 in Fig. 6) is made of a cesium iodide material (column 7, lines 33-35).

4. Claims 6-11, 15-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morton (US 5,693,947) in view of Perez-Mendez (US 5,596,198) and

Schiebel *et al.* (US 5,396,072) as applied to claim 1 above, and further in view of Polischuk *et al.* (US 5,880,472).

In regard to claims **6** and **7** which are dependent on claim 1, the modified detector of Morton lacks that the amorphous selenium i-layer is doped with chlorine (*e.g.*, 1-100 ppm) and arsenic (*e.g.*, 0.1-5%). Polischuk *et al.* teach (column 7, lines 9-12) that the i-layer of amorphous selenium is normally doped with chlorine (*e.g.*, 1-100 ppm) and arsenic (*e.g.*, 0.1-5%) to function as the photoconductive layer. Therefore it would have been obvious to one having ordinary skill in the art to provide an i-layer of amorphous selenium that is doped with chlorine (*e.g.*, 1-100 ppm) and arsenic (*e.g.*, 0.1-5%) in the modified detector of Morton, in order for the i-layer to function as a photoconductive layer as taught by Polischuk *et al.*

In regard to claim **8** which is dependent on claim 6, the modified detector of Morton lacks a n-layer that is a thin selenium layer doped with an alkaline metal or an oxide or halogenide of said metal. Schiebel *et al.* also teach that the n-layer is a thin selenium layer doped with an alkaline metal or an oxide or halogenide of said metal (column 5, lines 46-49) in order to minimize charge injection from the electrodes so as to reduce dark current (column 1, line 58 to column 2, line 1). Therefore it would have been obvious to one having ordinary skill in the art to provide a n-layer that is a thin selenium layer doped with an alkaline metal or an oxide or halogenide of said metal in the modified detector of Morton, in order to minimize charge injection from the electrodes so as to reduce dark current as taught by Schiebel *et al.*

In regard to claim **9** which is dependent on claim 8, the detector of Morton lacks that the alkaline metal is selected from lithium, sodium, potassium and cesium. Schiebel *et al.* also teach that the alkaline metal is selected from lithium, sodium, potassium and cesium (column 5, lines 46-49). Therefore it would have been obvious to one having ordinary skill in the art to provide a n-layer that is a thin selenium layer doped with an alkaline metal (*e.g.*, lithium, sodium, potassium, cesium) or an oxide or halogenide of said metal in the detector of Morton, in order to minimize charge injection from the electrodes so as to reduce dark current as taught by Schiebel *et al.*

In regard to claim **10** which is dependent on claim 6, the modified detector of Morton lacks a p-layer that is a thin layer of arsenic enriched amorphous selenium. Polischuk *et al.* also teach that the p-layer is a thin layer of arsenic enriched amorphous selenium (column 9, lines 16-21) in order to minimize charge injection from the electrodes (column 7, lines 22-30). Therefore it would have been obvious to one having ordinary skill in the art to provide a p-layer that is a thin layer of arsenic enriched amorphous selenium in the modified detector of Morton, in order to minimize charge injection from the electrodes as taught by Polischuk *et al.*

In regard to claim **11** which is dependent on claim 10, the modified detector of Morton lacks a p-layer with an arsenic enrichment of 1-38% by wt. Polischuk *et al.* also teach that the arsenic enrichment of the p-layer is 1-38% by wt (column 9, lines 16-21) in order to minimize charge injection from the electrodes (column 7, lines 22-30). Therefore it would have been obvious to one having ordinary skill in the art to provide a p-layer that is a thin layer of arsenic enriched amorphous selenium in the modified

detector of Morton, in order to minimize charge injection from the electrodes as taught by Polischuk *et al.*

In regard to claim **15** which is dependent on claim 6, the modified detector of Morton lacks an electrode formed by indium tin oxide. Electrodes formed by indium tin oxide are well known in the art. For example, Polischuk *et al.* teach (column 7, lines 9-12) that the light transparent biasing electrode is a co-planar indium tin oxide (ITO) layer (column 9, lines 39-44) which is well known in the art (column 4, lines 29-38) and commercially available (column 9, lines 10-13). Therefore it would have been obvious to one having ordinary skill in the art to provide an electrode formed by indium tin oxide in the modified detector of Morton.

In regard to claim **16** which is dependent on claim 6, the modified detector of Morton lacks a selenium based multilayer structure that is of the p-i-n type and the light transparent biasing electrode is set to a negative potential. Schiebel *et al.* also teach that the selenium based multilayer structure is of the p-i-n type and the light transparent biasing electrode is set to a negative potential (*i.e.*, blocking layers are interchanged for a p-i-n structure when negative voltage is applied to bias electrode; column 6, lines 50-56). Therefore it would have been obvious to one having ordinary skill in the art to provide a selenium based multilayer structure that is of the p-i-n type and the light transparent biasing electrode is set to a negative potential in the modified detector of Morton, in order to minimize charge injection from the electrodes so as to reduce dark current as taught by Schiebel *et al.*

In regard to claim **17** which is dependent on claim 6, Morton also teaches (Fig. 1) that a high voltage protective device (D1, D2) is also provided shunting the storage capacitance (column 6, lines 33-37).

In regard to claim **19** which is dependent on claim 1, the modified detector of Morton lacks an explicit description that the selenium based multilayer structure is optimized for minimum dark current and residual image. Morton teaches that it is desirable for the radiation converter (*e.g.*, a selenium based multilayer structure) to have little or no image lag (*i.e.*, residual image; column 11, lines 53-55). It is known in the art that residual image is due to dark current and modulated space charge. For example, Schiebel *et al.* teach that the selenium based multilayer structure is optimized for electrical transport without significant dark current which is defined as 1 pA/cm^2 (*i.e.*, where dark current is below 200 pA/cm^2; column 5, lines 62-66). As another example, Polischuk *et al.* teach that by blocking charge injection from the electrodes, both dark current and modulation of space charge (*i.e.*, residual image) can be minimized (column 13, lines 2-44; column 14, lines 1-20; see also Fig. 8b which shows minimal image lag in comparison to Fig. 8a). Therefore it would have been obvious to one having ordinary skill in the art to optimize the selenium based multilayer structure in the modified detector of Morton, in order to minimize charge injection from the electrodes so as to minimize dark current (*i.e.*, below 200 pA/cm^2) and residual image (*i.e.*, less than 5%).

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morton (US 5,693,947) in view of Perez-Mendez (US 5,596,198), Schiebel *et al.*

(US 5,396,072), and Polischuk *et al.* (US 5,880,472) as applied to claim 6 above, and further in view of Brauers *et al.* (US 6,128,362).

In regard to claim **12** which is dependent on claim 6, Schiebel *et al.* also teaches an example of where the n layer (*i.e.*, hole blocking) has a thickness of 0.5 and 2 μm. The modified detector of Morton lacks a description in which each of the n and p layers is less than 1 μm in thickness. Brauers *et al.* teach that blocking layers can be thin but the doping must be increased to compensate for a thinner blocking layer and provides an example of where the p layer (*i.e.*, electron blocking) has a thickness of 0.1 to 50 μm (column 5, lines 5-14). Therefore it would have been obvious to one having ordinary skill in the art to provide blocking layers of thickness less than 1 μm with appropriate doping in the modified detector of Morton, in order to minimize charge injection from the electrodes so as to reduce dark current.

6. Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morton (US 5,693,947) in view of Perez-Mendez (US 5,596,198) and Schiebel *et al.* (US 5,396,072) as applied to claim 1 above, and further in view of Kwasnick *et al.* (US 5,132,539).

In regard to claim **18** which is dependent on claim 1, the modified detector of Morton lacks a biasing electrode which also serves to match indices of refraction of the scintillator and the selenium based multilayer structure. Kwasnick *et al.* teach that the indices of refraction of the scintillator and the photodetector should be matched in order for the photons to readily pass from the scintillator into the photodetector (column 3, lines 16-24). Therefore it would have been obvious to one having ordinary skill in the

art to provide a biasing electrode which also serves to match indices of refraction of the scintillator and the selenium based multilayer structure in the modified detector of Morton, in order for the photons to readily pass from the scintillator into the selenium based multilayer structure as taught by Kwasnick *et al.*

In regard to claim **21** which is dependent on claim 1, the modified detector of Morton lacks a housing. Kwasnick *et al.* teach (column 1, line 17 to column 2, line 45) that it is known in the art to provide a housing enclosing an imaging array in order to protect the imaging array from the ambient environmental and to hermetically seal the housing to provide protection in high humidity environments. Therefore it would have been obvious to one having ordinary skill in the art to provide a housing in the modified detector of Morton, in order to protect the detector from the ambient environmental as taught by Kwasnick *et al.*

Response to Arguments

7. Applicant's arguments filed 9 June 2003 have been fully considered but they are not persuasive.

In response to applicant's argument (last paragraph on pg. 2 of remarks filed 9 June 2003) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, non-pixelated photoreceptor) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Moreover even if applicant's argument is considered, Morton states (column 2, lines 43-49) that "In this

particular embodiment, the radiation detector is suitable for the detection of X-radiation with high resolution, and the radiation converter 21 comprises a flat plate electrode 22 made from a suitable radiation-transmissive material and an ionisation medium 23, which could be a solid, liquid or a gas, contained within an ionisation chamber (not shown)" and (column 2, lines 62-67) that "As will be described in greater detail hereinafter, electrode 22 of the radiation converter presents a surface which is exposed to radiation being detected, and each discrete electrode 13 corresponds to a single pixel in the image of the detected radiation which is to be formed by the radiation detector". Thus Morton teaches it is not the radiation converter (21 in Fig. 1 or 201 in Fig. 6) which is pixilated, but rather, it is the collection electrodes (13 in Fig. 1 or 101 in Fig. 6) which forms a pixelated structure.

Applicant further argues (last paragraph on pg. 2 of remarks filed 9 June 2003) that Morton teaches away from the claim invention since Morton states that amorphous selenium is useful for detecting α, β, γ, and X-ray but does not mention that it can detect light. Examiner respectfully disagrees. It should be noted that Perez-Mendez was cited for teaching (column 6, lines 60-67) that "The p-i-n structure 57 has a sandwich-type configuration comprising an upper p-type layer 58, an intermediate layer 59 and a lower layer 60 preferably formed of hydrogenated amorphous silicon (a-Si:H), but alternatively selectable from a group of materials of like properties, such as amorphous selenium, antimony trisulphide, cadmium sulphide, antimony sulphide oxysulphide, and crystalline materials such as Si, Ge, gallium arsenide and their alloys" wherein the p-i-n structure 57 is used to detect light from a scintillator (see column 4, lines 6-11). To teach away from the claim invention, there must be some evidence that amorphous selenium cannot be used to detect light from a scintillator. However, an argument for teaching away from the claim invention based on an assertion that the reference does not teach that amorphous selenium can detect light is not persuasive

especially since it is clear from Perez-Mendez that amorphous selenium can detect light from a scintillator.

In response to applicant's argument (first paragraph on pg. 3 of remarks filed 9 June 2003) that Schiebel *et al.* is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Morton, Perez-Mendez, and Schiebel *et al.* are all classified within 250/370.09. Further, Morton states (column 3, lines 8-11) that "In operation of the radiation detector, incident radiation ionises the ionisation medium 23 creating electrons and positive ions, or in the case of a semiconductor, electrons and holes" and (column 7, lines 35-48) that "Layer 300 does not form part of the dual capacitive structure 10,20, but converts radiation that is to be detected (e.g. x-radiation or γ-radiation) to optical radiation, the intensity of optical radiation produced being dependent on the intensity of radiation to which layer 300 is exposed. Optical radiation produced in this way, passes through layer 300 and into layer 201 of the second capacitor 20. ... Individual photons entering layer 201 create electron-hole pairs in the semiconductor material of the layer". Thus, it should be recognized that Morton suggests a semiconductor structure which is used to convert incident radiation (*e.g.*, x-radiation or optical radiation) into electrons and holes. Moreover, Schiebel *et al.* was cited as an example that the properties of amorphous selenium p-i-n detectors (which is used to convert incident radiation into electrons and holes) are known in the art. Thus Schiebel *et al.* is also reasonably pertinent to the particular problem with which the applicant was concerned (*i.e.*, converting incident radiation into electrons and holes).

In response to applicant's argument (second paragraph on pg. 3 to second paragraph on pg. 4 of remarks filed 9 June 2003) that the references are not combinable because the detector of Perez-Mendez is a gamma ray camera based on a pixel photosensor array and the detector of Schiebel *et al.* concerns direct conversion of x-rays, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Morton discloses (column 10, line 35 to column 11, line 18) that "the radiation convertor may take a variety of different forms" such as "scintillators irradiating semiconductor layers". Perez-Mendez was cited for teaching (column 6, lines 60-67) that "The p-i-n structure 57 has a sandwich-type configuration comprising an upper p-type layer 58, an intermediate layer 59 and a lower layer 60 preferably formed of hydrogenated amorphous silicon (a-Si:H), but alternatively selectable from a group of materials of like properties, such as amorphous selenium, antimony trisulphide, cadmium sulphide, antimony sulphide oxysulphide, and crystalline materials such as Si, Ge, gallium arsenide and their alloys". Therefore it would have been obvious to one having ordinary skill in the art that the radiation convertor of Morton (when in the form of <u>semiconductor</u> <u>layers</u> irradiated by a scintillator) comprises (known in the art) <u>semiconductor</u> <u>layers</u> such as the amorphous selenium sandwich-type configuration as described by Perez-Mendez.

Applicant argues (last paragraph on pg. 4 of remarks filed 9 June 2003) that none of the cited references provide for a light absorber layer which is also a charge

transport layer. Examiner respectfully disagrees. Morton states (column 7, lines 35-48) that "Layer 300 does not form part of the dual capacitive structure 10,20, but converts radiation that is to be detected (e.g. x-radiation or γ-radiation) to optical radiation, the intensity of optical radiation produced being dependent on the intensity of radiation to which layer 300 is exposed. Optical radiation produced in this way, passes through layer 300 and into layer 201 of the second capacitor 20. ... Individual photons entering layer 201 create electron-hole pairs in the semiconductor material of the layer. In this embodiment, holes will drift towards layer 202 formed of n^+ -type material whereas electrons will drift towards a respective charge-collection electrode 101. In effect, the second capacitor 20 functions as a semiconductor drift chamber". Morton also discloses (column 10, line 35 to column 11, line 18) that "the radiation convertor may take a variety of different forms" such as "scintillators irradiating semiconductor layers". Thus it is clear that Morton teaches semiconductor layers which functions both as a light absorber layer and a charge transport layer. As discussed above, it would have been obvious to one having ordinary skill in the art that the radiation convertor of Morton (when in the form of semiconductor layers irradiated by a scintillator) comprises (known in the art) semiconductor layers such as the amorphous selenium sandwich-type configuration as described by Perez-Mendez.

In response to applicant's argument (first paragraph on pg. 5 of remarks filed 9 June 2003) that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d

1392, 170 USPQ 209 (CCPA 1971). Further, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, there is some teaching, suggestion, or motivation to do so found either in the references themselves. While Morton discloses (column 10, line 35 to column 11, line 18) that "the radiation convertor may take a variety of different forms" such as "scintillators irradiating semiconductor layers" (*e.g.*, scintillator 300 irradiating semiconductor layers 201 as illustrated in Figs. 6 and 7), the detector of Morton lacks an explicit description that the semiconductor layers are a 2-50 μm (or 5-20 μm) thick amorphous selenium multilayer structure. However, semiconductor layers being irradiated by scintillators are well known in the art. For example, Perez-Mendez teaches (column 6, lines 60-67) that the semiconductor layers being irradiated by scintillators are multilayer (*i.e.*, p-i-n) photoreceptors formed of a-Si:H or alternatively selectable from a group of materials of like properties such as amorphous selenium. Thus it would have been obvious to one having ordinary skill in the art that the radiation convertor of Morton (when in the form of <u>semiconductor</u> <u>layers</u> irradiated by a scintillator) comprises (known in the art) <u>semiconductor</u> <u>layers</u> such as the amorphous selenium sandwich-type configuration as described by Perez-Mendez.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL
August 26, 2003

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800